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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,028	09/11/2003	David M. Pepper	B-4077 618504-4	6773

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EXAMINER
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THOMAS, BRANDI N

ART UNIT	PAPER NUMBER
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2873

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/661,028	<b>Applicant(s)</b> PEPPER ET AL.	
	<b>Examiner</b> BRANDI N. THOMAS	<b>Art Unit</b> 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11, 22-26 and 33-41 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 6, 22-26 and 33-40 is/are rejected.
- 7) ☒ Claim(s) 2, 7, 9-11 and 41 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Detailed Action</u> .                  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5, 6, 22-26, and 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Copeland (6439728) in view of Bloom et al. (5808797).

Regarding claim 1, Copeland discloses, in figures 6A and 6B, an optical retro-reflective apparatus with modulation capability comprising: a retro-reflecting Fabry-Perot structure (402) including a pair of reflective surfaces (425 and 437) (col. 7, lines 24-26); and a micromechanical device (420) for moving at least one of the reflective surfaces (425 and 437) (col. 7, lines 10-18 and 26-37) but does not specifically disclose of said pair of reflective surfaces relative to another one of the reflective surfaces of said pair of reflective surfaces a distance which causes the pair of the reflective surfaces to switch between a reflective mode of operation and a transmissive mode of operation. Bloom et al. discloses, in figures 4-8, a micromechanical device for moving at least one of the reflective surfaces (38) of said pair of reflective surfaces (38) relative to another one of the reflective surfaces of said pair of reflective surfaces a distance which causes the pair of the reflective surfaces to switch between a reflective mode of operation and a transmissive mode of operation (col. 6, lines 47-54). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of

Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claim 5, Copeland discloses, in figures 6A and 6B, an optical retro-reflective apparatus with modulation capability, including a micromechanical device is a ME device (420) (col. 7, lines 10-18) but does not specifically disclose wherein the ME device is made using photolithographic techniques. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (fed Cir. 1985).

Regarding claim 6, Copeland discloses, in figures 6A and 6B, an optical retro-reflective apparatus for modulating an optical beam, the apparatus comprising: a retro-reflecting structure (202) including a substrate and a moveable grating structure (228) (col. 4, lines 51-65 but does not specifically disclose a micromechanical device for moving the moveable grating structure relative to the substrate to cause the retro-reflecting structure to switch between a retro-reflective mode of operation and a non-retro-reflective mode of operation, the micromechanical device being responsive to a signal to impart modulation to an optical beam which is retro-reflected from the retro-reflecting structure. Bloom et al. discloses, in figures 4-8, a micromechanical device for moving the moveable grating structure (30) relative to the substrate (not numbered) to cause the retro-reflecting structure (10) to switch between a retro-reflective mode of operation and a non-retro-reflective mode of operation (col. 6, lines 47-54), the micromechanical device

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being responsive to a signal to impart modulation to an optical beam which is retro-reflected from the retro-reflecting structure (10) (col. 6, lines 54-57).

Regarding claim 22, Copeland discloses, in figures 6A and 6B, a retro-reflecting structure (202 and 402) having at least one movable optical element (228) for selectively reflecting the optical beam impinging the retro-reflective structure (202) (col. 4, lines 51-65), the moveable optical element (228) having a first position in which the retro reflecting structure (202 and 402) retro-reflects the optical beam and having a second position in which the retro-reflecting structure does not retro-reflect the optical beam (col. 4, lines 51-65 and col. 6, lines 26-37) but does not specifically disclose b. a micromechanical device for moving said at least one moveable optical element in response to a modulation signal to thereby modulate the optical beam as a modulated retro-reflected beam. Bloom et al. discloses, in figures 4-8, b. a micromechanical for moving said at least one moveable optical element (34) in response to a modulation to thereby modulate the optical beam as a modulated retro-reflected beam (col. 6, lines 54-57). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claim 23, Copeland discloses the claimed invention but does not specifically disclose wherein the retro-reflecting structure includes at least a pair of reflective surfaces, at least one of said surfaces including the at least one optical element which is moved less than a wavelength of the optical beam in order to modulate the retro-reflected beam. Bloom et al. discloses, in figures 4-8, an apparatus for retro-reflecting and modulating an optical beam, wherein the retro-reflecting structure (10) includes at least a pair of reflective surfaces (38), at

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least of said surface including the at least one optical element (34) which is moved less than a wavelength of the optical beam in order to modulate the retro-reflected beam (col. 6, lines 57-65). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claims 24 and 26, Copeland and Bloom et al. disclose the claimed invention but do not specifically disclose wherein the pair of reflective surfaces are arranged in either a cat's eye or a corner cube configuration. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the reflective surfaces in either a cat's eye or a corner cube for the purpose of modulating the intensity of the retroreflected beam, since such a modification would have involved a mere change in the shape of a component . Furthermore, a change in shape is generally recognized as being within the level of ordinary skill in the art (In re Rose, 105 USPQ 237 (CCPA 1955)).

Regarding claim 25, Copeland discloses the claimed invention but does not specifically disclose wherein the retro-reflecting structure includes a substrate and a grating structure, at least one of said substrate and said grating structure comprising the at least one optical element which is moved less than a wavelength of the optical beam in order to modulate the retro-reflected beam. Bloom et al. discloses, in figures 4-8, an apparatus for retro-reflecting and modulating an optical beam, wherein the retro-reflecting structure (10) includes a substrate (not numbered) and a grating structure (30), at least one of said substrate (not numbered) and said grating structure (30) comprising the at least one optical element (34) which is moved less than a wavelength of the optical beam in order to modulate the retro-reflected beam (col. 6, lines 57-65). Therefore it

would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claims 33 and 35, Copeland discloses, in figure 6A and 6B, an optical retro-reflective apparatus with modulation capability but does not specifically disclose a first reflective surface; a second reflective surface having a first position in which the retro-reflecting apparatus retro-reflects an optical beam and having a second position in which the retro-reflecting apparatus does not retro-reflect the optical beam; and a micromechanical device operable to move the second reflective surface between the first position and the second position, wherein the first reflective surface and the second reflective surface are parallel to each other in the first position and the second position Bloom discloses, in figure 1, a first reflective surfaces (11) (section 0004); a second reflective surface (12) having a first position in which the retro-reflecting apparatus retro-reflects an optical beam and having a second position in which the retro-reflecting apparatus does not retro-reflect the optical beam (section 0004) but does not specifically disclose a micromechanical device operable to move the second reflective surface between the first position and the second position, wherein the first reflective surface and the second reflective surface are parallel to each other in the first position and the second position. Bloom et al. discloses, in figures 4-8, a micromechanical device operable to move the second reflective surface between the first position and the second position, wherein the first reflective surface and the second reflective surface are parallel to each other in the first position and the second position (col. 6, lines 47-54). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the

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micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claim 34, Copeland discloses, in figures 6A and 6B, an optical retro-reflective apparatus with modulation capability but does not specifically disclose wherein the first and second positions being spaced by a distance less than a wavelength of the optical beam. Bloom et al. discloses, in figures 4-8, wherein the first and second positions being spaced by a distance less than a wavelength of the optical beam (col. 6, lines 54-57). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claims 36, 37, and 39, Copeland discloses the claimed invention but does not specifically disclose wherein the substrate is at least partially reflective. Bloom et al. discloses, in figures 4-8, an optical retro-reflective apparatus for modulating an optical beam, wherein the substrate is at least partially reflective (col. 6, lines 20-30). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

Regarding claims 38 and 40, Copeland discloses the claimed invention but does not specifically disclose wherein the moveable grating structure is configured at least partially reflect an optical beam towards the partially reflective surface. Bloom et al. discloses, in figures 4-8, an optical retro-reflective apparatus for modulating an optical beam, wherein the moveable grating structure (30) is configured to at least partially reflect an optical beam towards the partially



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reflective surface (col. 6, lines 34-42). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device of Copeland with the micromechanical device of Bloom et al. for the purpose of reflecting and deflecting light (col. 6, lines 47-54).

***Allowable Subject Matter***

3. Claims 2, 7, 9-11, and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in claim(s) 2, 7, and 41, wherein the claimed invention comprises, in claims 2 and 7, wherein the retro-reflecting structure includes a corner cube arrangement with the pair of reflective surfaces forming at least one angled reflecting surface of the corner cube arrangement and another reflecting surface forming another angled reflecting surface of the corner cube arrangement; and in claim 41, wherein the retro-reflecting structure includes a first grating structure and a second grating structure, at least one of said grating structures comprises the at least one optical element which is moved less than a wavelength of the optical beam in order to modulate the retro-reflected beam, as claimed.

***Response to Arguments***

5. Applicant's arguments filed 2/27/08 have been fully considered but they are not persuasive. Applicant argues that the prior art does not disclose moving the entire grating structure relative to the substrate. However, the claimed invention does not specifically recite moving the entire grating structure relative to the substrate. The claimed limitation states "moving the grating structure" and therefore, the rejection stands.

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRANDI N. THOMAS whose telephone number is (571)272-2341. The examiner can normally be reached on Monday - Thursday from 6-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brandi N Thomas/  
Examiner  
Art Unit 2873

BNT  
May 23, 2008

/Ricky L. Mack/  
Supervisory Patent Examiner, Art Unit 2873